THE JOHNSON COMPANY, INC.
*Environmental Sciences and Engineering*

085



February 25, 1998

Ms. Beth Torpey, Environmental Coordinator
Citizens Utilities Vermont Electric Division
P.O. Box 604
Newport, Vermont 05855

Re: Border Substation Soils Investigation, Derby Line, Vermont
JCO # 3-0313-5

Dear Beth:

Following is a summary of the work performed at the above-referenced site Tuesday, February 10, 1998 and the resulting findings. Our findings indicate that a reportable situation exists at the Border Substation according to 10 V.S.A. §6615. Pursuant to your instructions, Monday, February 23, 1998 we verbally notified the Vermont Waste Management Division (WMD) of the reported presence of petroleum and PCB contamination in soil boring SB-5. We are also sending the WMD a copy of this letter according to your instructions.

## SUMMARY

The Johnson Company oversaw six soil borings at the Citizens Utilities Border Substation in Derby Line, Vermont on Tuesday, February 10, 1998 (the Site; see attached Site location map). The soil borings were performed by Adams Engineering of Underhill, Vermont. The work was done for Citizens Utilities Vermont Electric Division (the Client). The Border Substation is a point of entry to the United States for Canadian power, and has been in operation since approximately 1975. The Client informed us that a release of PCB transformer oil had occurred at the Site, and that a partial remedial action had been performed sometime between 1989 and 1992. The purpose of the soil borings was to define whether any residual contamination is present, and if so, to estimate its horizontal and vertical extent.

Soil samples were collected from each boring by The Johnson Company. Three selected soil samples were sent to Endyne Laboratories in Williston, Vermont for analysis of PCBs and Total Petroleum Hydrocarbons. The results of this work show that soil contaminated with PCB transformer oil is present from 0'-5' below ground surface (bgs) at SB-5, near the concrete slab. Subsurface migration of the contamination toward the east, north and west appears to be limited to within 10-15 feet of SB-5. Contaminant migration beneath the slab is unknown. All of the borings encountered sandy and gravelly soils to depth, and no groundwater was encountered in any soil boring. Field screening measurements from bagged soil samples were all within background concentrations.

## METHODOLOGY

The Johnson Company worked with Adams Engineering to advance 2" split spoon samplers in six locations near the reported point of release. The weather at the time of the site work was sunny and the temperature ranged from 0-15° F. The samplers were advanced under vibratory pressure. The depths

of the borings ranged from 7 feet at SB-1 to 15 feet at SB-3 and SB-5. Soil samples were collected directly from the samplers for laboratory analysis in clear glass 250 milliliter jars with screw lids. Generally, two soil samples were collected from each boring except at SB-5. There, three soil samples were collected because recovered samples had an oily odor. One soil sample was collected from SB-6.

Samples collected for field headspace screening were placed in gallon size reclosable plastic bags. Due to the cold weather, the bags were warmed in the garage at the Citizens Utilities Pine Hill Warehouse (Derby VT) for approximately 5-10 minutes at the end of the field day. An OVM Model 580B Photoionizer (PID) was used to perform the field screening. The PID was field calibrated before the start of boring work to 100 ppmV isobutylene gas. After warming, each bag was opened slightly, the wand of the PID was inserted into the bag and the resulting measurement was recorded.

Twelve soil samples were collected during the boring work. Of these, three were sent to the laboratory for analytical testing. All three samples were collected from SB-5 (SS-5A, 0'-5' bgs; SS-5B, 5'-10' bgs; SS-5C, 10'-15' bgs). These samples were selected due to an oily odor in the upper ten feet of this soil boring. The rest of the soil samples had no oily odor and were not laboratory analyzed. Samples destined for laboratory analysis were carried by Johnson Company personnel using chain of custody procedures, directly to the laboratory on Wednesday February 11, 1998.

## RESULTS

The results of the soil boring work indicate that transformer oil contaminated with Aroclor-1260 has migrated downward from the point of release (approximately the ground surface) to approximately 5-10 feet bgs. Contaminant migration toward the west, north and east appears to be less than 10-15 feet from the point of release based on the apparently clean soils at the other soil borings. The extent of migration beneath the unused slab is unknown at present.

PID measurements collected from bagged soil samples were generally at background levels, as might be anticipated given the non-volatile nature of transformer oil. The soils encountered in the borings are generally medium to coarse sand and gravel. They are very well drained, with no groundwater or mottling encountered in any soil boring.

With respect to applicable state and federal standards, the reported Aroclor 1260 concentration in SS-5A of 637 parts per billion (ppb) is above the EPA Region III Residential Risk-based Action Level of 320 ppb, but is below the federal Toxic Substances Control Act (TSCA) standard of 50 parts per million (ppm) to be designated as hazardous waste. The reported TPH concentration in SS-5A of 6,560 ppm is above the State of Vermont guideline of 1,000 ppm.

## RECOMMENDATIONS

This limited subsurface investigation has revealed the presence of both TPH and PCBs at reported concentrations greater than current WMD standards. Normally, this would lead to a recommendation for limited remediation However, given the nature of the site and its soils (fenced, non-residential, town water nearby, deep soils to water table, limited volume of contaminated soils), it may be possible to leave these soils in place without creating significant risk to nearby receptors,

following further definition of the extent of contamination beneath the slab. This will require removal of the inactive transformers and concrete pad followed by soil sample collection. All subsequent work will require the written concurrence of the Vermont Waste Management Division before performance.

Please review this information and contact us with any questions. Thank you for the opportunity to perform this work for Citizens Utilities.

Sincerely,

THE JOHNSON COMPANY, INC.

By: Alan R. Liptak

Alan R. Liptak, C.P.G.
Senior Scientist

attachments

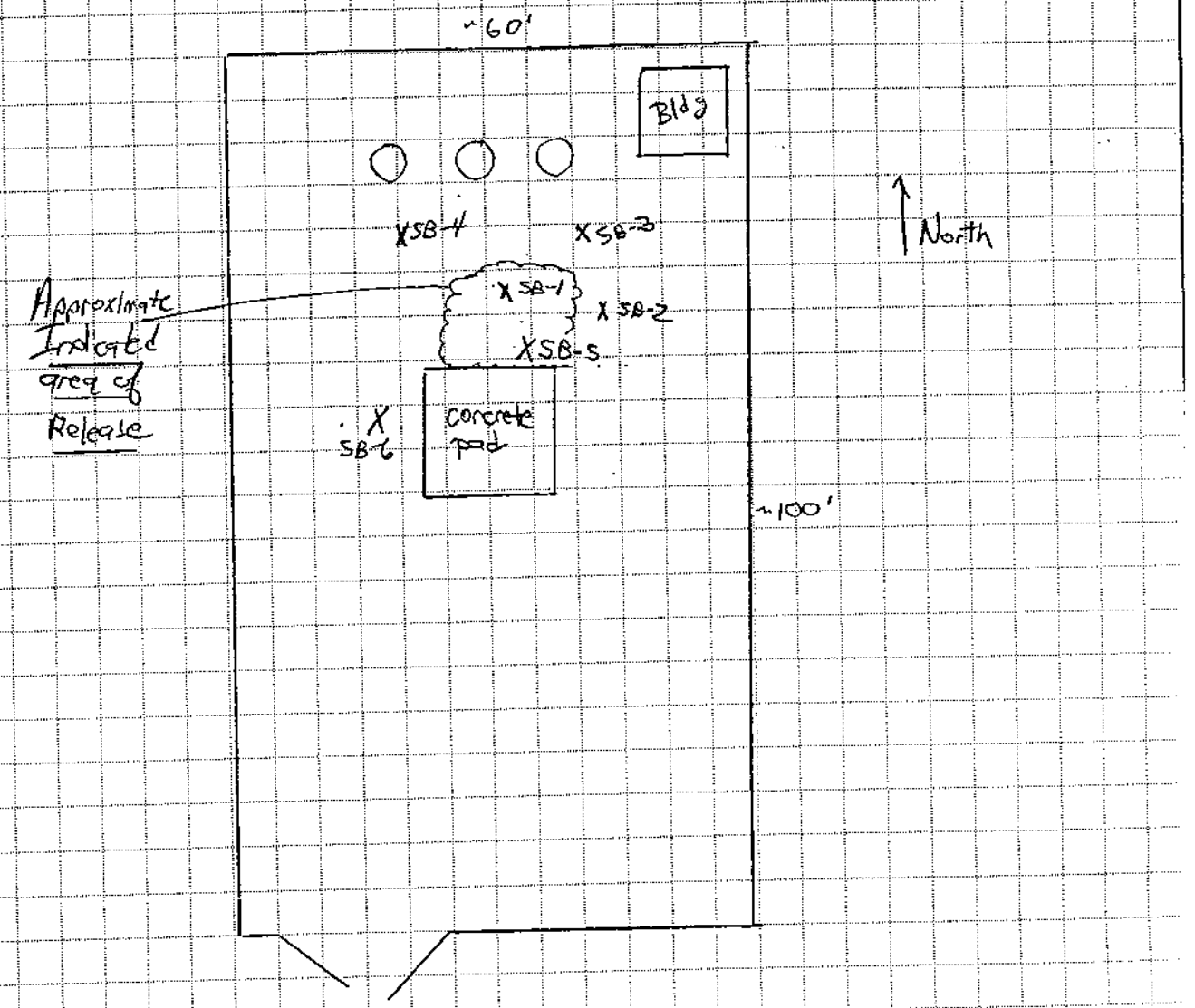
cc w/ attachments: Michael Smith, Vermont Department of Environmental Conservation

Reviewed By: dmm
I:\PROJECTS\3-0313-5\INVEST.LTR February 25, 1998 arl

**THE JOHNSON CO., INC.**
100 State Street, Suite 600
MONTPELIER, VERMONT 05602
(802) 229-4600

JOB 3-0313-5
SHEET NO. 1 OF 1
CALCULATED BY AL DATE 2/12/98
CHECKED BY _____ DATE _____
SCALE _____

# Citizens Utilities Barden Substation Site Sketch




Soil Borings 2/10/98 Adams Eng.

All soil borings approximate

3-0313-
~~3-0313-~~
ARL

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103



# REPORT OF LABORATORY ANALYSIS

CLIENT: The Johnson Company, Inc.
PROJECT NAME: Citizens Utilities
DATE REPORTED: February 18, 1998
DATE SAMPLED: February 10, 1998

PROJECT CODE: JOCO1349
REF. #: 116,482 - 116,484

Enclosed please find the results of the analyses performed for the samples referenced on the attached chain of custody record.

Chain of custody did not indicate sample preservation.

All samples were prepared and analyzed by requirements outlined in the referenced methods and within the specified holding times.

All instrumentation was calibrated with the appropriate frequency and verified by the requirements outlined in the referenced methods.

Blank contamination was not observed at levels affecting the analytical results.

Analytical method precision and accuracy were monitored by laboratory control standards which included matrix spike, duplicate and quality control analyses. These standards were determined to be within established laboratory method acceptance limits.

Reviewed by,

Harry B. Locker, Ph.D.
Laboratory Director

enclosures

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

# LABORATORY REPORT

## TOTAL PETROLEUM HYDROCARBONS (TPH) BY MODIFIED EPA METHOD 8100

DATE: February 18, 1998
CLIENT: The Johnson Company, Inc.
PROJECT: Citizens Utilities
PROJECT CODE: JOCO1349
COLLECTED BY: Alan Liptack
DATE SAMPLED: February 10, 1998
DATE RECEIVED: February 11, 1998

| Reference # | Sample ID | Concentration (mg/kg)[1] |
|---|---|---|
| 116,482 | SS-5A; 2:00 | 6,560. |
| 116,483 | SS-5B; 2:00 | 124. |
| 116,484 | SS-5C; 2:00 | ND[2] |

Notes:

1 Values quantitated based on the response of #2 Fuel Oil. Method detection limit is 5.0 mg/kg.
2 None detected

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333

# CHAIN-OF-CUSTODY RECORD

25903

| | | |
|---|---|---|
| Project Name: Citizens Utilities<br>Site Location: | Reporting Address: | Billing Address: |
| Endyne Project Number: JOCO 1349 | Company: Johnson Company<br>Contact Name/Phone #: Alan Liptack | Sampler Name: Alan Liptack<br>Phone #: |

| Lab # | Sample Location | Matrix | G R A B | C O M P | Date/Time | Sample Containers No. | Sample Containers Type/Size | Field Results/Remarks | Analysis Required | Sample Preservation | Rush |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 116482 | SS-5A | | | | 2/10/98 2:00pm | | | | PCB, TPH, DRO | | |
| 116483 | SS-5B | | | | ↓ | | | | ↓ | | |
| 116484 | SS-5C | | | | ↓ | | | | ↓ | | |
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|---|---|---|
| Relinquished by: Signature | Received by: Signature | Date/Time 2/11/98 |
| Relinquished by: Signature | Received by: Signature | Date/Time |

New York State Project: Yes ____ No ____

Requested Analyses

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | pH | 6 | TKN | 11 | Total Solids | 16 | Metals (Specify) | 21 | EPA 624 | 26 | EPA 8270 B/N or Acid |
| 2 | Chloride | 7 | Total P | 12 | TSS | 17 | Coliform (Specify) | 22 | EPA 625 B/N or A | 27 | EPA 8010/8020 |
| 3 | Ammonia N | 8 | Total Diss. P | 13 | TDS | 18 | COD | 23 | EPA 418.1 | 28 | EPA 8080 Pest/PCB |
| 4 | Nitrite N | 9 | $BOD_5$ | 14 | Turbidity | 19 | BTEX | 24 | EPA 608 Pest/PCB | | |
| 5 | Nitrate N | 10 | Alkalinity | 15 | Conductivity | 20 | EPA 601/602 | 25 | EPA 8240 | | |
| 29 | TCLP (Specify: volatiles, semi-volatiles, metals, pesticides, herbicides) | | | | | | | | | | |
| 30 | Other (Specify): | | | | | | | | | | |

# CHAIN OF CUSTODY RECORD

№ 1874

| Client/Project Name | Project Location |
|---|---|
| Citizens Utilities | Derby Line VT |
| **Project No.** | **Field Logbook No.** |
| 3-0313-5 | ALCZN |
| **Sampler: (Signature)** | **Chain of Custody Tape No.** |
| Allen Lyttle | — |

| Sample No./ Identification | Date | Time | Lab Sample Number | Type of Sample | ANALYSES: PCB-Normal Method | ANALYSES: TPH | ANALYSES | ANALYSES | ANALYSES | ANALYSES | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SS-5A | 2/10/98 | 2:00 PM | | | X | X | | | | | A-Odor-Hot |
| SS-5B | ↓ | ↓ | | | X | X | | | | | B- " " |
| SS-5C | ↓ | ↓ | | | X | X | | | | | C- ? clean |
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| | Date | Time | | Date | Time |
|---|---|---|---|---|---|
| Relinquished by: (Signature) Allen Lyttle | 2/10/98 | 0930 | Received by: (Signature) Lisa Maguggo | 2/11/98 | 0930 |
| Relinquished by: (Signature) Lisa Maguggo | | | Received by: (Signature) | 2/11/98 | 1030 |
| Relinquished by: (Signature) | | | Received for Laboratory: (Signature) | | |

| Sample Disposal Method: | Disposed of by: (Signature) | Date | Time |
|---|---|---|---|
| | | | |

**SAMPLE COLLECTOR**


5 State Street
Montpelier, VT 05602
(802) 229-4600
Fax: (802) 229-5876

THE JOHNSON COMPANY, INC.
Environmental Sciences and Engineering


**ANALYTICAL LABORATORY**

Endyne -

Report to ALCJco
cc- Beth Torpey

Bill to: Beth Torpey
Citizens Utilities
POBox 604
Newport VT

1974-3-84

WHITE - To accompany sample to the lab and returned to the Johnson Co. YELLOW -

3-0313-5
Ael

ENDYNE, INC.
Laboratory Services
32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7405



# REPORT OF LABORATORY ANALYSIS

CLIENT: The Johnson Company, Inc.
PROJECT NAME: Citizens Utilities
DATE REPORTED: February 23, 1998
DATE SAMPLED: February 10, 1998

PROJECT CODE: JOCO1348
REF. #: 116,479 - 116,481

Enclosed please find the results of the analyses performed for the samples referenced on the attached chain of custody record.

Chain of custody did not indicate sample preservation.

All samples were prepared and analyzed by requirements outlined in the referenced methods and within the specified holding times.

All instrumentation was calibrated with the appropriate frequency and verified by the requirements outlined in the referenced methods.

Blank contamination was not observed at levels affecting the analytical results.

Analytical method precision and accuracy were monitored by laboratory control standards which included matrix spike, duplicate and quality control analyses. These standards were determined to be within established laboratory method acceptance limits.

Individual sample performance was monitored by the addition of surrogate analytes to each sample. All surrogate data was determined to be within Laboratory QA/QC guidelines unless otherwise noted.

Reviewed by,

for

Harry B. Locker, Ph.D.
Laboratory Director

enclosures

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

# LABORATORY REPORT

## MODIFIED EPA METHOD 8080 -- AROCLORS (SOIL)

CLIENT: The Johnson Company, Inc.
PROJECT NAME: Citizens Utilities
REPORT DATE: February 23, 1998
DATE SAMPLED: February 10, 1998
DATE RECEIVED: February 11, 1998
DATE EXTRACTED: February 17, 1998

PROJECT CODE: JOCO1348
ANALYSIS DATE: February 18, 1998
STATION: SS-5A
REF.#: 116,479
TIME SAMPLED: 2:00 p.m.
SAMPLER: Alan Liptack

| Parameter | Detection Limit (ug/kg) | Concentration (ug/kg) as received |
|---|---|---|
| Aroclor-1016 | 200 | ND[1] |
| Aroclor-1221 | 200 | ND |
| Aroclor-1232 | 200 | ND |
| Aroclor-1242 | 200 | ND |
| Aroclor-1248 | 200 | ND |
| Aroclor-1254 | 200 | ND |
| Aroclor-1260 | 200 | 637. |
| Unspecified PCB | 200 | ND |

PERCENT SOLIDS: 91.%

Analytical Surrogate Recovery:

Dibutylchlorendate: 109.%

NOTES:

1 None detected

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

# LABORATORY REPORT

## MODIFIED EPA METHOD 8080 -- AROCLORS (SOIL)

CLIENT: The Johnson Company, Inc.
PROJECT NAME: Citizens Utilities
REPORT DATE: February 23, 1998
DATE SAMPLED: February 10, 1998
DATE RECEIVED: February 11, 1998
DATE EXTRACTED: February 17, 1998

PROJECT CODE: JOCO1348
ANALYSIS DATE: February 18, 1998
STATION: SS-5B
REF.#: 116,480
TIME SAMPLED: 2:00 p.m.
SAMPLER: Alan Liptack

| Parameter | Detection Limit (ug/kg) | Concentration (ug/kg) as received |
|---|---|---|
| Aroclor-1016 | 200 | ND[1] |
| Aroclor-1221 | 200 | ND |
| Aroclor-1232 | 200 | ND |
| Aroclor-1242 | 200 | ND |
| Aroclor-1248 | 200 | ND |
| Aroclor-1254 | 200 | ND |
| Aroclor-1260 | 200 | ND |
| Unspecified PCB | 200 | ND |

PERCENT SOLIDS: 91.%

Analytical Surrogate Recovery:

Dibutylchlorendate: 121.%

NOTES:

1 None detected

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

# LABORATORY REPORT

## MODIFIED EPA METHOD 8080 -- AROCLORS (SOIL)

CLIENT: The Johnson Company, Inc.
PROJECT NAME: Citizens Utilities
REPORT DATE: February 23, 1998
DATE SAMPLED: February 10, 1998
DATE RECEIVED: February 11, 1998
DATE EXTRACTED: February 17, 1998

PROJECT CODE: JOCO1348
ANALYSIS DATE: February 18, 1998
STATION: SS-5C
REF.#: 116,481
TIME SAMPLED: 2:00 p.m.
SAMPLER: Alan Liptack

| Parameter | Detection Limit (ug/kg) | Concentration (ug/kg) as received |
|---|---|---|
| Aroclor-1016 | 200 | ND[1] |
| Aroclor-1221 | 200 | ND |
| Aroclor-1232 | 200 | ND |
| Aroclor-1242 | 200 | ND |
| Aroclor-1248 | 200 | ND |
| Aroclor-1254 | 200 | ND |
| Aroclor-1260 | 200 | ND |
| Unspecified PCB | 200 | ND |

PERCENT SOLIDS: 96.%

Analytical Surrogate Recovery:

Dibutylchlorendate: 105.%

NOTES:

1 None detected

ENDYNE, INC.

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333

# CHAIN-OF-CUSTODY RECORD

25903

| | | |
|---|---|---|
| Project Name: Citizens Utilities<br>Site Location: | Reporting Address: | Billing Address: |
| Endyne Project Number: 5000134B | Company: Johnson Company<br>Contact Name/Phone #: Alan Liptack | Sampler Name: Alan Liptack<br>Phone #: |

| Lab # | Sample Location | Matrix | G R A B | C O M P | Date/Time | Sample Containers No. | Sample Containers Type/Size | Field Results/Remarks | Analysis Required | Sample Preservation | Rush |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 116479 | SS-5A | | | | 2/10/98 2:00pm | | | | PCB, TPH, BTEX | | |
| 116480 | SS-5B | | | | ↓ | | | | ↓ | | |
| 116481 | SS-5C | | | | ↓ | | | | ↓ | | |
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| Relinquished by: Signature | Received by: Signature | Date/Time 2/11/98 |
| Relinquished by: Signature | Received by: Signature | Date/Time |

New York State Project: Yes ____ No ____

Requested Analyses

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | pH | 6 | TKN | 11 | Total Solids | 16 | Metals (Specify) | 21 | EPA 624 | 26 | EPA 8270 B/N or Acid |
| 2 | Chloride | 7 | Total P | 12 | TSS | 17 | Coliform (Specify) | 22 | EPA 625 B/N or A | 27 | EPA 8010/8020 |
| 3 | Ammonia N | 8 | Total Diss. P | 13 | TDS | 18 | COD | 23 | EPA 418.1 | 28 | EPA 8080 Pest/PCB |
| 4 | Nitrite N | 9 | $BOD_5$ | 14 | Turbidity | 19 | BTEX | 24 | EPA 608 Pest/PCB | | |
| 5 | Nitrate N | 10 | Alkalinity | 15 | Conductivity | 20 | EPA 601/602 | 25 | EPA 8240 | | |
| 29 | TCLP (Specify: volatiles, semi-volatiles, metals, pesticides, herbicides) | | | | | | | | | | |
| 30 | Other (Specify): | | | | | | | | | | |

# CHAIN OF CUSTODY RECORD

№ 1874

| Client/Project Name | Project Location |
|---|---|
| Citizens Utilities | Derby Line Vt |
| **Project No.** | **Field Logbook No.** |
| 3-0313-5 | ALCZN |
| **Sampler: (Signature)** | **Chain of Custody Tape No.** |
| Allen Pratt | — |

| Sample No./ Identification | Date | Time | Lab Sample Number | Type of Sample | ANALYSES: PCB - Normal / Method | TPH | | | | | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SS-5A | 2/10/98 | 2:00 Pm | | | X | X | | | | | A - Odor - Hot |
| SS-5B | ↓ | ↓ | | | X | X | | | | | B - " " |
| SS-5C | ↓ | ↓ | | | X | X | | | | | C - ? clean |
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|---|---|---|---|---|---|
| Relinquished by: (Signature) Allen Pratt | Date 2/10/98 | Time 0930 | Received by: (Signature) Liam Guggo | Date 2/11/98 | Time 0930 |
| Relinquished by: (Signature) Liam Guggo | Date | Time | Received by: (Signature) M Farrell | Date 2/11/98 | Time 1030 |
| Relinquished by: (Signature) | Date | Time | Received for Laboratory: (Signature) | Date | Time |
| Sample Disposal Method: | Disposed of by: (Signature) | | | Date | Time |

**SAMPLE COLLECTOR**


5 State Street
Montpelier, VT 05602
(802) 229-4600
Fax: (802) 229-5876

THE JOHNSON COMPANY, INC.
*Environmental Sciences and Engineering*


**ANALYTICAL LABORATORY**

Endyne -
Report to ALC@JCo
cc- Beth Torpey

Bill to: Beth Torpey
Citizens Utilities
PO Box 604
Newport Vt

1974-3-84

WHITE - To accompany sample to the lab and returned to the Johnson Co. YELLOW - Lab copy PINK - Transporter copy ORANGE - Sampler copy

ADAMS ENGINEERING
Gerard Adams
#47 Blakey Rd. Underhill, Vt. 05489-9493
(802)-899-4945
Fed. ID 03-0296943

February 14, 1998

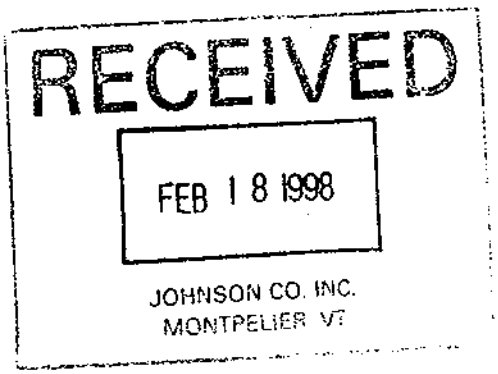
Citizens Utilities
PO 604
Newport, VT. 05855

1.0329-6

INVOICE: Soil borings Derby Line Sub Station per PO A007608

| | |
|---|---|
| 2/10/98 06:15 > 16:45 Less .5 Hrs. = 9.75 Hrs. @ $60/Hr. | $585 |
| TOTAL DUE | $585 |

Thank You
G. Adams



10329-6
ARL

ADAMS ENGINEERING
Mr. Gerard Adams
#47 Blakey Rd., Underhill, VT 05489-9493
(802)-899-4945

February 14, 1998

Mr.Alan Liptak
The Johnson Co.
Boring Logs: Derby Line Substation/Citizens Utilities

2" Drag bit used to drill pilot hole to -.5' through frost. Soils sampled in open borehole with 2 3/5" OD X 2 3/8" ID X 5' NQ and 2 /3/16" OD X 1 13/16" ID X 5' BQ sampler lined with a polyethylene bag, the sampler brought to the surface, and the sample contained in the liner vibrated out for examination. Citizens did not want to backfill holes.

2/10/98 SB # 1
SOILS

| | |
|---|---|
| 0>-4.9' | NQ Sampler. Frozen top soil, dark brown coarse sand & few stones, typ. |
| -4.9>7.0' | Refusal, dark brown silty sand & cobbles. |

SB #2

| | |
|---|---|
| 0>-4.9' | Similar to #1. |
| -4.9>9.9' | No sampled pushed stone. |
| -9.9>12.8' | Drove point to -11, NQ sampler to refusal -12.8', dark brown coarse sand & cobbles, typ. |

SB #3

| | |
|---|---|
| 0>-4.9' | Typical soils. |
| -4.9>9.9' | Typ., poor recovery. |
| -9.9>14.9' | BQ sampler. Dark brown coarse sand & cobbles, good recovery PE bag usually broke. |

SB #4 BQ sampler, typ. Soils.
SB #5

| | |
|---|---|
| 0>4.9' | Typ. Soils silty lens, smelled of transformer oil. |
| -4.9>9.9' | Same // (over) lens light brown silty medium sand. |
| -9.9>14.9' | Dark brown coarse sand, gravel, & cobbles-clean. |

SB #6 Typ. Soils >-9.9'

G. Adams